

REMARKS

The Applicants hereby submit the present Amendment and Request for Reconsideration for the above-referenced patent application, entry of which is earnestly solicited. Claim 28 of the present application has been amended; no claims have been canceled. Thus, claims 1-30 are pending in the present application.

In the Office Action mailed on 22 April 2005, the Examiner objected to claim 28 under 35 U.S.C. § 1.75 as being a substantial duplicate of claim 26. In response, the Applicants amend claim 28 to overcome the Examiner's objection.

In the same Office Action, the Examiner rejected claims 1-10, 12-20 and 22-30 under 35 U.S.C. §103(a) as being unpatentable over Applicant admitted prior art (figures 1-10; specification pages 5-10) in view of U.S. Patent No. 6,452,763 to Gill. In response, the Applicants respectfully submit that the claims are allowable for the following reasons.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations", MPEP § 2143. Furthermore, "objective evidence or secondary considerations such as unexpected results are relevant to the issue of obviousness and must be considered in every case where in which they are present", MPEP § 2141 35 U.S.C. § 103; the Graham Factual Inquiries.

"First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings." The initial burden is on the Examiner to provide some suggestion or motivation of the desirability of doing what the

Applicants have done in the present application. In the present case, the Examiner states that “[o]ne of ordinary skill in the art would have been motivated to manufacture the first pinned layer of the admitted prior art with a cobalt material as taught by Gill to improve structure and composition of the pinned layer, thus provide increased specular scattering, and, in turn improved performance of the overall disk drive system.”

In response, the Applicant’s respectfully disagree. In a self-pinned structure, adequate self-pinning properties must be achieved through magnetostriction and ABS stress, for example. One ordinarily skilled in designing a *self-pinned structure* would be initially motivated to achieve adequate self-pinning properties of the sensor. Motivation of one ordinarily skilled for such a design is stated in the present application: “ attempts have been made to increase the magnetostriction of the AP self-pinned layer structure to improve its self-pinning effect . By proportionally increasing the iron content in cobalt-iron pinned layers, for example, the magnetostriction was shown to increase. For example, the magnetostriction increased by about a factor of two (2) using $\text{Co}_{60}\text{Fe}_{40}$ materials in the AP pinned layers.” As apparent, one ordinarily skilled in designing a *self-pinned structure* would tend to utilize more iron content in the pinned layers – not, as the Examiner suggests, little or no iron.

Further, as the Examiner is using Applicants admitted prior art in the present application, it should be considered as a whole *including any teachings away* from combining references. Clearly, the description which states “[b]y proportionally increasing the iron content in cobalt-iron pinned layers, for example, the magnetostriction was shown to increase. For example, the magnetostriction increased by about a factor of two (2) using $\text{Co}_{60}\text{Fe}_{40}$ materials in the AP pinned layers” teaches away from Gill because it suggests the use of higher iron content cobalt-iron, not pure cobalt.

“Second, there must be a reasonable expectation of success” to combine the references. In the design phase of a sensor having an AP self-pinned structure, one ordinarily skilled in art would naturally adhere to guiding principles of material usage at the present time. This is described in the present application: “it is generally true that proportionally increasing the iron content in cobalt-iron increases the magnetostriction in

an AP self-pinned layer structure. For example, the magnetostriction increases by about a factor of two (2) with use of $\text{Co}_{60}\text{Fe}_{40}$ materials in the AP self-pinned layers.” As apparent, one ordinarily skilled in the art would understand that “proportionally increasing the iron content in cobalt-iron increases the magnetostriction in an AP self-pinned layer structure”. Thus, one skilled in the art would not consider utilizing a pure cobalt material in an AP self-pinned layer structure as there exists no reasonable expectation of success for achieving adequate self-pinning properties.

Third, “ objective evidence or secondary considerations such as unexpected results are relevant to the issue of obviousness and must be considered in every case where in which they are present.” General expectations for the use of pinned layer materials are described in the present application: “ it is generally true that proportionally increasing the iron content in cobalt-iron increases the magnetostriction in an AP self-pinned layer structure. For example, the magnetostriction increases by about a factor of two (2) with use of $\text{Co}_{60}\text{Fe}_{40}$ materials in the AP self-pinned layers.” Unexpected results from use of the present invention are also described in the present application: “[h]owever, we have found that cobalt material in itself provides more positive magnetostriction than cobalt-iron in self-pinned applications. In fact, measurements show that the magnetostriction can be increased by 50% to almost a factor of three (3) with use of a cobalt film in a particular configuration... Furthermore, we have found that a more specific arrangement of cobalt film in the AP self-pinned layer structure provides an additional advantage. Specifically, the magnetoresistance coefficient $\Delta r/R$ of the sensor as well as the magnetostriction may be increased by utilizing cobalt (Co) in the second AP pinned layer and cobalt-iron (CoFe) in the first AP pinned layer.” See also Tables 1 and 2 of the present application. Clearly, utilizing pure cobalt in an AP self-pinned layer structure has produced advantageous unexpected results.

Regarding claims 8, 10, 19, 22 and 27 specifically, the Examiner states that “Gill inherently discloses that the magnetostriction of the pinned layers are increased (see discussion in column 4, lines 12-32)”. In column 4 at lines 12-15, Gill states that


"[a]ccordingly, it is an overall object of the present to provide an improved spin valve sensor that overcomes many or all of the above-discussed short-comings in the art." In the background section of Gill in column 3 at lines 20-24, however, Gill states that "[i]t is desired in the construction of spin valves to keep magnetostriction to a minimum." Clearly, the Examiner's point is contradicted by Gill. Also, this teaching of Gill may teach away from the needs and requirements of the present application; in the present application, there is a need to increase the magnetostriction of the self-pinned sensor, not decrease it.

Based on the above, the Applicant submit that all pending claims are allowable over the prior art of record and that the present application is now in a condition suitable for allowance.

Additional reasons for allowability of several dependent claims are not further described as these rejections are now moot.

Thank you. Please feel free to contact the undersigned if it would expedite the prosecution of the present application.

Respectfully submitted,



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